DOCUMENT RESUME

ED 175 856 SP 014 748

AUTHOR Kuhs, Therese M.; Freeman, Donald J.
TITLE The Potential Influence of Textbooks on Teachers' Selection of Content for Elementary School Mathematics. Research Series No. 48.
INSTITUTION Michigan State Univ., East Lansing. Inst. for Research on Teaching.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE May 79
CONTRACT 400-76-0073
NOTE 40p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, California, April 8-12, 1979)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Content Analysis; Core Curriculum; Course Content; Decision Making; *Elementary Education; *Mathematics Instruction; *Teacher Attitudes; Teaching Methods; *Teaching Skills; Textbook Content; *Textbook Selection

ABSTRACT

The research reported in this paper identifies the "core curriculum" and "optional curriculum" suggested by widely used textbooks of elementary school mathematics and describes the influence of each on teacher autonomy in selecting the content of instruction. Preliminary analyses suggest that the "core curriculum" is generally consistent with recent educational trends, while the freedom of choice suggested by the "optional curriculum" seems to demand a high level of mathematics expertise on the part of teachers. (Author)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED175856

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Research Series No. 48

THE POTENTIAL INFLUENCE OF TEXTBOOKS ON TEACHERS' SELECTION OF CONTENT FOR ELEMENTARY SCHOOL MATHEMATICS

Therese M. Kuhs and Donald J. Freeman

Published By

The Institute for Research on Teaching
252 Erickson Hall
Michigan State University
East Lansing, Michigan 48824

Printed and Distributed
by the
College of Education
Michigan State University

May 1979

This work is sponsored in part by the Institute for Research on Teaching, College of Education, Michigan State University. The Institute for Research on Teaching is funded primarily by the Teaching Division of the National Institute of Education, United States Department of Health, Education, and Welfare. The opinions expressed in this publication do not necessarily reflect the position, policy, or endorsement of the National Institute of Education. (Contract No. 400-76-0073)

SD 014748

Institute for Research on Teaching

Teachers' thoughts and decisions are the focus of studies currently under way at Michigan State University's Institute for Research on Teaching (IRT). The IRT, founded in April 1976 with a $3.6 million grant from the National Institute of Education, has major projects investigating teacher decision-making, including studies of reading diagnosis and remediation, classroom management strategies, instruction in the areas of language arts, reading, and mathematics, teacher education, teacher planning, effects of external pressures on teachers' decision, and teachers' perceptions of student affect. Researchers from many different disciplines cooperate in IRT research. In addition, public school teachers work at IRT as half-time collaborators in research, helping to design and plan studies, collect data, and analyze results. The Institute publishes research reports, conference proceedings, occasional papers, and a free quarterly newsletter for practitioners. For more information or to be placed on the IRT mailing list please write to: The IRT Editor, 252 Erickson, MSU, East Lansing, Michigan 48824.

Director: Lee S. Shulman

Associate Director: Judith E. Lanier

Editorial Staff:

Lawrence W. Lezotte, coordinator of Communications/Dissemination
Linda Shalaway, IRT editor
Janet Flegg, assistant editor

The Potential Influence of Textbooks on Teachers' Selection of Content for Elementary School Mathematics[1]

Therese M. Kuhs and Donald J. Freeman[2]

Introduction

When analyzing curricula it is extremely useful to differentiate between content of instruction (*what* is taught) and instructional methods (*how* something is taught). Until recently, however, studies of the impact of teaching on student performance have concentrated primarily on method, neglecting content. The central role of content analysis in several recent investigations illustrates a growing awareness of the need to consider content as well as instructional strategy in research on teaching (Airasion & Madaus, 1976; Jenkins & Pany, 1976; Armbruster, Stevens, & Rosenshine, Note 1; Porter, Schmidt, Floden, & Freeman, Note 2; Grosser, Note 3; Perkins & Buchanan, Note 4; and Buchanan & Milazzo, Note 5).

This increased interest in the content of instruction is founded on the belief that content is related to student performance. Those studies that have attempted to link content and achievement have typically supported this belief (Hungerman, 1967; McDonald, Note 6; Husen, 1967; Comber & Keeves, 1973; and Walker & Schaffarszick, 1974). According to the National Longitudinal Study of Mathematical Abilities, "student

---

[1]Paper presented to the annual meeting of the American Educational Research Association, San Francisco, 1979.

[2]Therese M. Kuhs is a research intern with IRT's Content Determinants Research program. Donald J. Freeman is a senior researcher with that same program.

achievement, to a substantial extent, mirrors the content treated in the textbook: Students are more likely to learn what they have been taught than something else" (Wilson, Cahen & Begel, Note 7, Vo. 12, p. 82).

It is, therefore, somewhat surprising that the issue of content selection has rarely been considered in research on teaching. Despite increased interest in research on teacher decision making, for example, none of the published studies deal with factors that influence teacher decisions concerning the content to be taught (Anderson, 1977; Shavelson, 1976; Shavelson, Caldwell, & Izu, 1977; Shulman & Elstein, 1975). With evidence that variation in content covered causes variation in student achievement, it has become important to find out what factors influence content selection in the first place. The content analyses described in this report are part of a series of interrelated studies attempting to delineate factors that influence teachers' content selections conducted by the Institute for Research on Teaching (IRT).

What is Content?

Virtually everyone associated with education has some notion of what is meant by the "content of instruction." It is clear, however, that this meaning varies dramatically from one individual to the next. Our deliberations regarding the meaning of this concept have not resulted in a precise definition. However, we have identified parameters which might characterize the content of instruction (Freeman, Note 14). These parameters reflect a deliberate attempt to distinguish the content of instruction from the teaching strategy. They also reflect our interest in teacher decision making in that they describe content from the teacher's perspective in terms of what the teacher intends to teach rather than what the students actually learn.

Conceptual Model

The identification of factors that potentially influence content selection can be seen from two distinct perspectives. One perspective is characteristic of curriculum reform movements, in which teachers are seen as specialists and authorities and therefore autonomous decision makers who must be persuaded to teach certain content. The contrasting perspective is consistent with the accountability movement of the 1970s, where teachers are seen not as autonomous decision makers but as "employees owing obedience" (Corwin, 1970). Even though the accountability and dissemination perspectives imply different perceptions of teacher autonomy, they are inextricably linked; both are considered in the working model which underlies research on teacher selection of content.

This conceptual model includes two distinct sets of variables. The first set consists of a full range of external factors suggested by the accountability movement, as well as variables suggested by the dissemination perspective. Factors of interest outside the classroom include external pressures (such as mandated objectives, required testing programs, and textbook adoptions), and various forms of interpersonal persuasion (such as interactions with parents, colleagues, and university staff). The second set of variables consists of "internal" or mediating variables. These include teacher conceptions of the subject matter and assessment of student readiness. The effect of external factors is likely to be mediated by variables of this sort. A teacher who values student understanding of mathematics, for example, may be more resistant to external pressures advocating emphasis on computation skills than a teacher who does not.

If teachers are responsive to external pressures, as this model implies, there is a clear need to examine the "implied curricula" of each external factor. We are therefore conducting a series of analyses that will provide measures of the content covered in two major sources of influence, standardized tests and textbooks. Our earlier analysis of four widely used standardized tests suggests that there is enough important variation in the content of the tests to justify our belief that these differences could cause variation in content covered in classrooms (Floden, Porter, Schmidt, & Freeman, Note 8). The purpose of the analysis reported in this paper is to determine whether significant differences in the implied curricula of commonly used fourth-grade mathematics textbooks could also cause variation in the content of classroom instruction.

Focus of this Study

Fourth-grade mathematics was selected as the initial context of our investigations for several reasons. Mathematics is generally considered a basic skill that all children in elementary school should study. Also, it seems to be a subject that is primarily learned in school, and one for which precise and careful descriptions of content variation are possible. The focus on fourth-grade allows for substantial variance in what might be taught, both because of the range of topics which might be offered to students who are progressing at an average rate and because of the need to vary topics in response to differences in student readiness.

The potential impact of textbooks on teacher's decisions about "what to teach" is suggested by the results of two nationwide surveys conducted in the last decade (NACOME, Note 9 and NCTM In-Service, Note 10). Over 75% of the teachers in the NACOME survey reported using a single textbook

predominantly in the classroom, and 53% of the teachers reported that they followed the texts closely. Since the content of mathematics instruction in a significant number of American classrooms may be determined primarily by the content of textbooks, the implied curriculum of these texts merits close consideration.

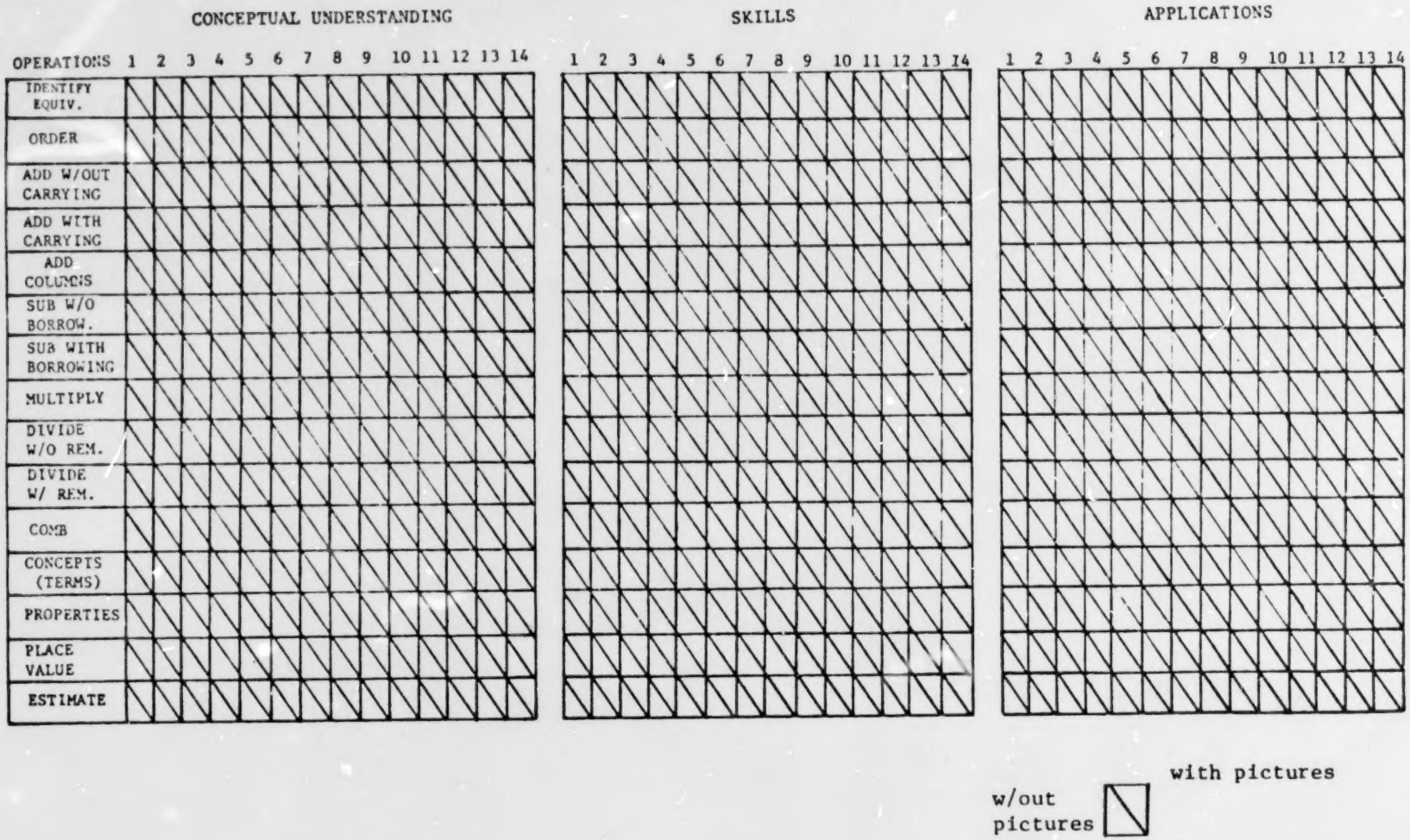
The work reported in this paper differs from earlier efforts to classify the content of elementary school mathematics textbooks (Avital & Shettleworth, Note 11; Blake, Ellis, Findley, & Westbrook, Note 12; Bloom, 1956; Buchanan, Note 13; Wood, 1968) in two important ways. First, taxonomies used in the earlier studies were not appropriate for our purposes. Some taxonomies contain categories too general to detect significant differences in content, while others offer descriptions that are too specific to suggest topics which teachers would be apt to focus upon in planning instruction. Second, our analysis considers the most recent editions of widely used textbook series. These editions are apt to reflect changes in content consistent with the "back to basics" movement.

Methodology

Because measurement of content is crucial to any attempt to delineate factors which influence selection of content, a great deal of effort has gone into the development of a taxonomy that would provide a content description at a level where teacher decision making is most likely to occur. The classification system we have developed is a three-dimensional matrix (see Figure 1) where each cell represents a topic that teachers may elect to cover or not to cover. This taxonomy has been successfully applied in earlier studies of the similarities and differences in content of standardized tests (Schmidt, Note 15).

Figure 1

Taxonomy Matrix



NATURE OF MATERIAL

1. sing. dig./basic facts
2. sing. & mult. digit
3. multiple digit
4. no. sen./phrase
5. alg. sen./phrase
6. sing./like frac.
7. unlike frac.
8. mixed no.
9. decimals
10. percents
11. measurement
12. essn. units of measurement
13. geometry
14. other

The classification manual used in these studies has been slightly modified to accomodate both textbooks and tests (Kuhs, Schmidt, Porter, Floden, Freeman, & Schwille, Note 16). The three dimensions of the matrix describe: the general intent of the lesson (e.g., conceptual understanding or application), the nature of the material presented to students (e.g., measurement or decimals), and the operation students must perform (e.g., estimate or multiply). A complete list of the categories corresponding to each dimension is shown in Figure 2. The revised version of the classification manual served as the primary reference in the authors' analysis of the content of three widely used textbooks of fourth-grade mathematics:

1. Mathematics in Our World, Addision-Wesley Publishing Co., 1978
2. Mathematics, Houghton-Mifflin Co., 1978
3. Mathematics Around Us, Scott-Foresman & Co., 1978

These three textbooks are similar in format and organization. Lessons identified in each book include three distinct components: (1) a stated objective, (2) an instructional activity directed by the teacher, and (3) student exercises. A complete description of the content of each text should include an analysis of each of these components as well as a description of the various enrichment activities provided as optional assignments in many of the lessons. However, we elected to focus solely on the student exercises for the preliminary work. This decision was based on practical considerations, as well as the results of the NACOME survey, which suggests the majority of teachers rely primarily on this segment of a textbook. Thus variation in the content of student exercises is more apt to promote variation in the content of classroom instruction than differences in the other two portions of a lesson. Although this focus limits the preliminary analysis to a partial description of the content

Figure 2

TAXONOMY

Factor I: General Intent

1) Conceptual Understanding with Models
2) Conceptual Understanding without Models
3) Skill Reading Graphs, Tables, Measurements
4) Computational/Numeration Skills
5) Applications Involving Graphs, Tables, etc.
6) Applications without Graphs, Tables, etc.

Factor II: Nature of Material

1) Single Digits or Basic No. Facts
2) Single & Multiple Digits
3) Miltiple Digit Numbers
4) No. Sentences/Phrases
5) Algebraic Sentences/Phrases
6) Single or Like Fractions
7) Unlike Fractions
8) Mixed Numbers
9) Decimals
10) Percents
11) Measurement
12) Essential Units of Measurement
13) Geometry
14) Other

Factor III: Operations

1) Identify Equivalents
2) Order
3) Add without Carrying
4) Add with Carrying
5) Column Addition
6) Subtract without Borrowing
7) Subtract with Borrowing
8) Multiply
9) Divide without Remainder
10) Divide with Remainder
11) Combination
12) Apply Concepts (Terms)
13) Apply Properties
14) Identify Place Value
15) Estimate

of each text, the findings reported in this paper have prompted us to conduct a more complete analysis of each book.

Every item in each exercise was classified on all three factors of the classification matrix. The number of items corresponding to a given cell in the matrix was determined for each lesson then summed across all lessons to provide totals for the entire textbook. By analyzing the content in this manner, it was possible to generate two independent indices of content emphasis. The first measure, percent of items, reflects the depth of coverage provided for a given topic. We determined it by dividing the sum of items in a given cell by the total number of items in the textbook. The second measure, termed percent of lessons, reflects the breadth of coverage provided for a given topic. We determined it by dividing the number of lessons containing at least one item corresponding to a given cell by the total number of lessons in the textbook.

The combination of these two measures provides a more complete picture of content emphasis than either measure alone.

Consider the following example:

	% of total items	% of total lessons
multiplication facts	10.0	15.5
single fractions	4.0	35.0

In the textbook portrayed in this example, multiplication facts are stressed to a greater extent than single fractions, but items dealing with this topic are concentrated in a smaller number of lessons. Thus the combination of the two measures reflects variance in how topics are treated in a textbook.

One of the most significant features of the taxonomy is its flexibility in describing content at different levels of detail. Each cell in the matrix represents a specific topic that teachers might elect to cover in the classroom (e.g., solving story problems that require the multiplication of single digit whole numbers). At the same time, descriptions that correspond to the marginals of Figure 1 represent general topics that might be included in the mathematics curriculum (e.g., fractions, division with remainder, story problems).

Marginal Analysis

Item Frequency

Table 1 reports the content analyses for the marginals. The first entry for each textbook represents the percent of items that cover the topic; the second entry is the percent of lessons that deal with the category. The impact of the current "back to basics" and "minimal competency" trends is evidenced in all three textbooks by the distribution of items across categories in the taxonomy. In Factor I, over 50% of the lessons and items in each text focus on skills. Furthermore, the concentration of items in the whole number levels (1, 2, and 3) within Factor II and the computation levels (3 through 11) within Factor III suggests basic arithmetic is a major component of the curricula of all three texts.

Despite its focus on the basics, the Scott-Foresman (SF) textbook seems to have a different overall orientation. At Factor I, this text has a larger proportion of items dealing with conceptual understanding (23.7%) and applications (13.1%) than the other books. This difference in orientation is also reflected by a comparison of the distribution of items for some of the categories in the other two factors. At Factor II, the Scott-Foresman book has the lowest proportion (56.9%) of items

Table 1

Content Analyses for the Marginals*

Factor I: Intent/Mode	A.W. Items	A.W. Lessons	H.M. Items	H.M. Lessons	S.F. Items	S.F. Lessons
1. Understanding w/aids	4.9	(15.4)	5.7	(20.8)	11.6	(27.6)
2. Understanding w/out	5.0	(8.9)	6.2	(17.3)	11.1	(25.0)
Total Understanding	9.9	(24.3)	12.9	(38.1)	23.7	(52.6)
3. Skills w/graphs, etc.	2.2	(8.3)	1.1	(6.5)	7.0	(13.8)
4. Skills w/out	77.6	(51.5)	80.9	(72.6)	57.0	(60.7)
Total skills	79.8	(59.8)	82.0	(79.1)	64.0	(74.5)
5. Appl. w/graphs, etc.	3.2	(11.8)	1.4	(11.9)	4.8	(10.2)
6. Appl. w/out	7.0	(37.9)	4.7	(48.2)	8.3	(27.6)
Total Applications	10.2	(49.7)	6.1	(60.1)	13.1	(37.8)
Factor II: Nature of Material						
1. Sing. Dig./no. facts	27.9	(16.6)	29.8	(37.5)	23.1	(19.4)
2. Sing. & Mult. Dig.	15.7	(22.5)	24.8	(40.5)	9.8	(21.4)
3. Mult. Digit	26.3	(33.7)	20.6	(34.5)	24.0	(36.2)
4. No. Sen./Phrase	0.8	(0.6)	0.01	(0.6)	4.2	(11.2)
5. Alg. Sen/Phrase	1.5	(3.0)	0.04	(0.6)	2.1	(4.6)
6. Sing./like fract.	3.3	(6.5)	7.3	(14.3)	4.2	(10.2)
7. Unlike frac.	3.4	(4.7)	2.5	(4.8)	4.0	(9.2)
8. Mixed No.	4.5	(5.3)	0.6	(2.4)	2.0	(4.6)
9. Decimals	7.3	(13.0)	6.7	(20.2)	6.4	(16.8)
10. Percents	0	(0.0)	0	(0.0)	0	(0.0)
11. Measurement	5.9	(29.0)	1.6	(16.7)	5.0	(18.4)
12. Essn. Units of Meas.	1.5	(6.0)	2.6	(11.9)	4.9	(9.2)
13. Geometry	0.9	(8.3)	3.3	(8.9)	10.3	(16.8)
Other		(0.0)	0.0	(0.0)	0.1	(0.5)
Factor III: Operations						
1. Ident. Equiv.	9.5	(21.9)	10.4	(27.4)	18.3	(33.2)
2. Order	0.7	(2.4)	2.8	(11.9)	2.6	(9.7)
3. Add w/out carrying	4.9	(7.7)	8.0	(23.2)	5.1	(15.3)
4. Add w/ carrying	4.4	(16.6)	5.6	(16.1)	3.5	(9.7)
5. Add columns	3.4	(10.7)	2.4	(15.5)	2.6	(10.2)
6. Subtract w/out bor.	4.9	(10.7)	4.7	(21.4)	6.6	(13.8)
7. Subtract w/bor.	7.7	(22.5)	3.6	(12.5)	4.3	(12.2)
8. Multiply	26.7	(27.8)	29.1	(38.1)	22.5	(26.5)
9. Divide w/out Rem.	13.1	(19.5)	16.7	(31.5)	8.1	(15.8)
10. Divide with Rem.	7.4	(10.7)	8.0	(10.7)	5.0	(12.8)
11. Combination	3.0	(9.5)	0.4	(5.4)	1.0	(4.1)
12. Concepts (terms)	4.7	(14.8)	2.8	(8.9)	11.2	(26.5)
13. Properties	0.04	(0.6)	0.04	(0.0)	1.6	(2.0)
14. Place Value	3.0	(2.4)	2.5	(6.5)	4.8	(9.2)
15. Estimate	6.5	(10.7)	2.9	(7.7)	3.0	(4.6)
N =	4165	169	6886	168	4380	196

*Entries are percents

involving whole numbers (sum of levels 1, 2, and 3) and the highest proportion in Geometry (10.3%) and Essential Units of Measurement (4.9%). At Factor III this book has the lowest concentration of items (35.6%) involving multiplication or division (sum of levels 8, 9, and 10) and the highest percent of items involving terminology (11.2%) and place value (4.8%).

Even though the Addison-Wesley (AW) and Houghton-Mifflin (HM) books are similar in their general orientation toward skill development at Factor I, differences in their treatment of the basics is suggested by the distribution of items in Factors II & III. The Addison-Wesley book contains a higher proportion of items that deal with mixed numbers (4.5%), subtraction with borrowing (7.7%), estimation (6.5%), and the combined use of two or more basic operations (3.0%). The Houghton-Mifflin, on the other hand, has a higher proportion of items dealing with single or like fractions (7.3%), addition of two numbers (13.6% -- sum of Levels 3 and 4), and division (24.7% -- sum of Levels 9 and 10).

Lesson Frequency

To this point the discussion has focused on the proportion of items in each text that deal with general categories in the taxonomy. This analysis has not considered how items of a given type are distributed across lessons. It is possible, for example, that items dealing with a topic such as multiplication may be concentrated in a few lessons or dispersed across a large number of lessons. Further evidence of differences in content treatment among textbooks may therefore be suggested by an analysis which contrasts percent of lessons with percent of items.

Perhaps the most interesting difference suggested by this contrast involves the distribution of items across lessons in the Scott-Foresman text.

Although the percent of items dealing with application in this book (13%) is larger than that for the other two books (AW -- 10%, HM -- 6%), the proportion of lessons dealing with this category (38%) is smaller (AW -- 50%, HM -- 60%). Thus, items that deal with application are concentrated in a comparatively small number of lessons within the Scott-Foresman text. This pattern is reversed for division with remainders where this book has the smallest proportion of items (5%) distributed over the largest percent of lessons (13%). Thus, textbooks may vary in breadth as well as depth of coverage of selected topics. It is therefore important to consider both measures of content emphasis when describing differences in the implied curricula textbooks.

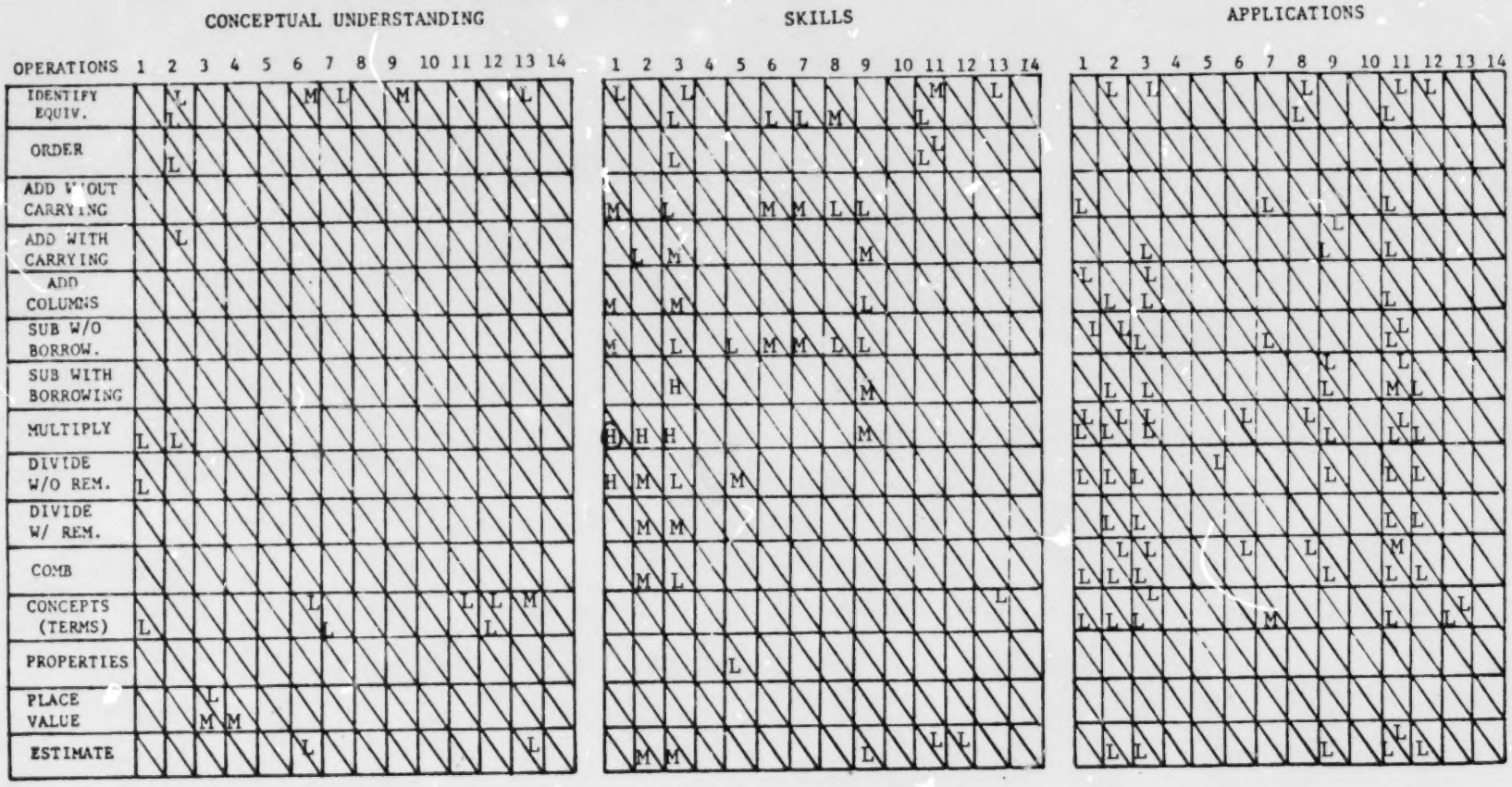
Cell Level Analysis

An analysis of content at the cell level within the taxonomy provides a basis for comparing the treatment of specific topics within textbooks (e.g., applications involving the multiplication of single-digit numbers). Figures 3, 4, and 5 depict the concentration of items representing specific topics within each of the three texts. Four general categories are used to depict the relative frequency of items in each cell of the taxonomy. The symbol "H" denotes high frequency cells in which 5 to 10% of the items fall. When the "H" is circled, over 10% of the items in the text are concentrated in that cell. An "M" designates cells containing a moderate concentration of items (0.5% to 5.0%) and "L" indicates cells containing a low frequency of items (less than 0.5%). Cells which have no symbols are "empty", meaning that content does not occur in the textbook.

The Addison-Wesley text (Figure 3) considers more specific topics (80 cells) in the application category than in either of the other two

Figure 3

Distribution of Items in the Addison Wesley Fourth Grade Text



L = Less than 0.5% (21 Items)
M = 0.5% to 5.0% (208 Items)
H = 5% to 10% (416 Items)
Ⓗ = More than 10%

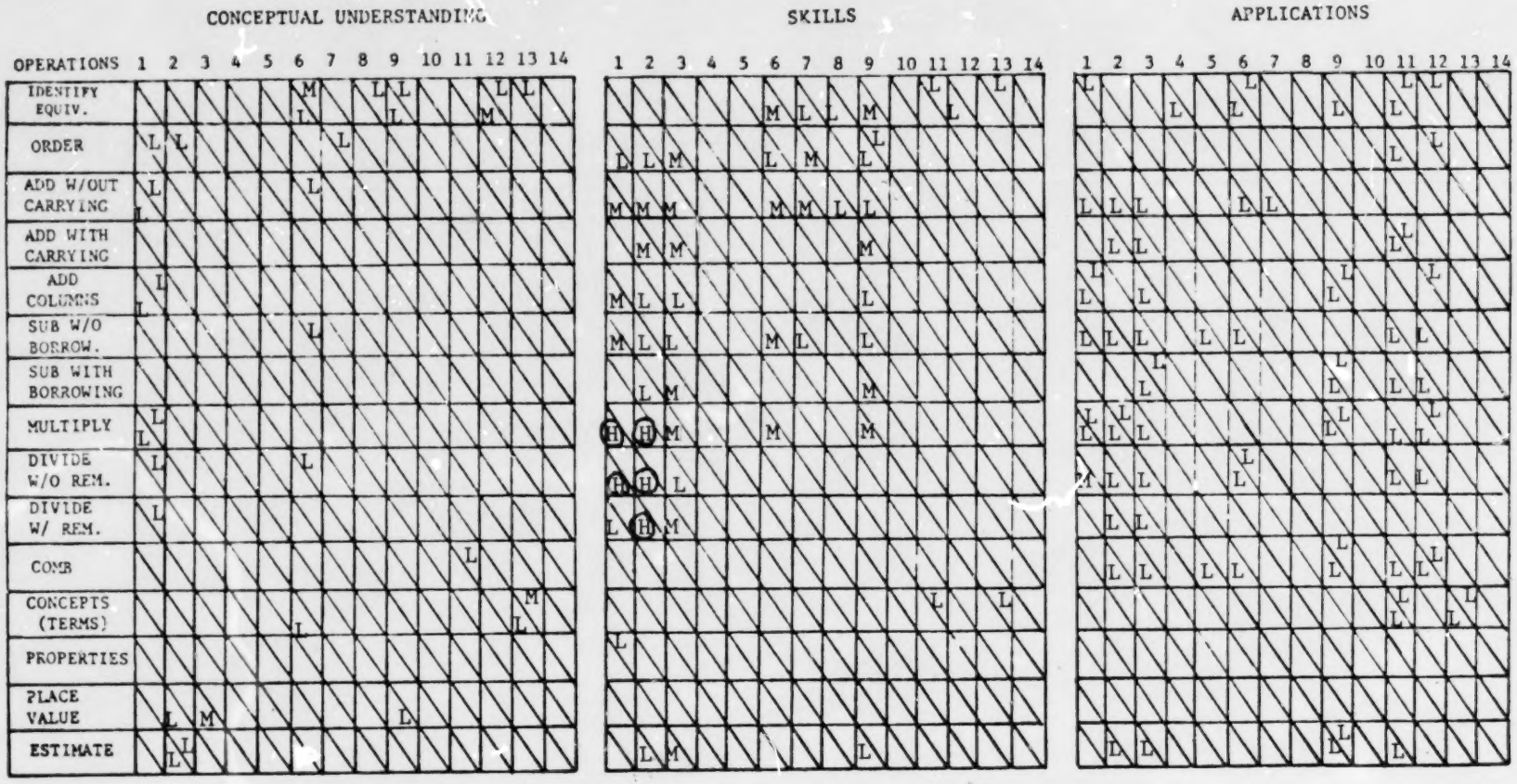
w/out pictures

with pictures

NATURE OF MATERIAL

1. sing. dig./basic facts
2. sing. & mult. digit
3. multiple digit
4. no. sen./phrase
5. alg. sen./phrase
6. sing./like frac.
7. unlike frac.
8. mixed no.
9. decimals
10. percents
11. measurement
12. essn. units of measurement
13. geometry
14. other

Distribution of Items in the Houghton Mifflin Fourth Grade Text



L = less than 0.5% (41 Items)
M = 0.5% to 5.0% (344 Items)
H = 5% to 10% (688 Items)
Ⓗ = more than 10%

w/out pictures

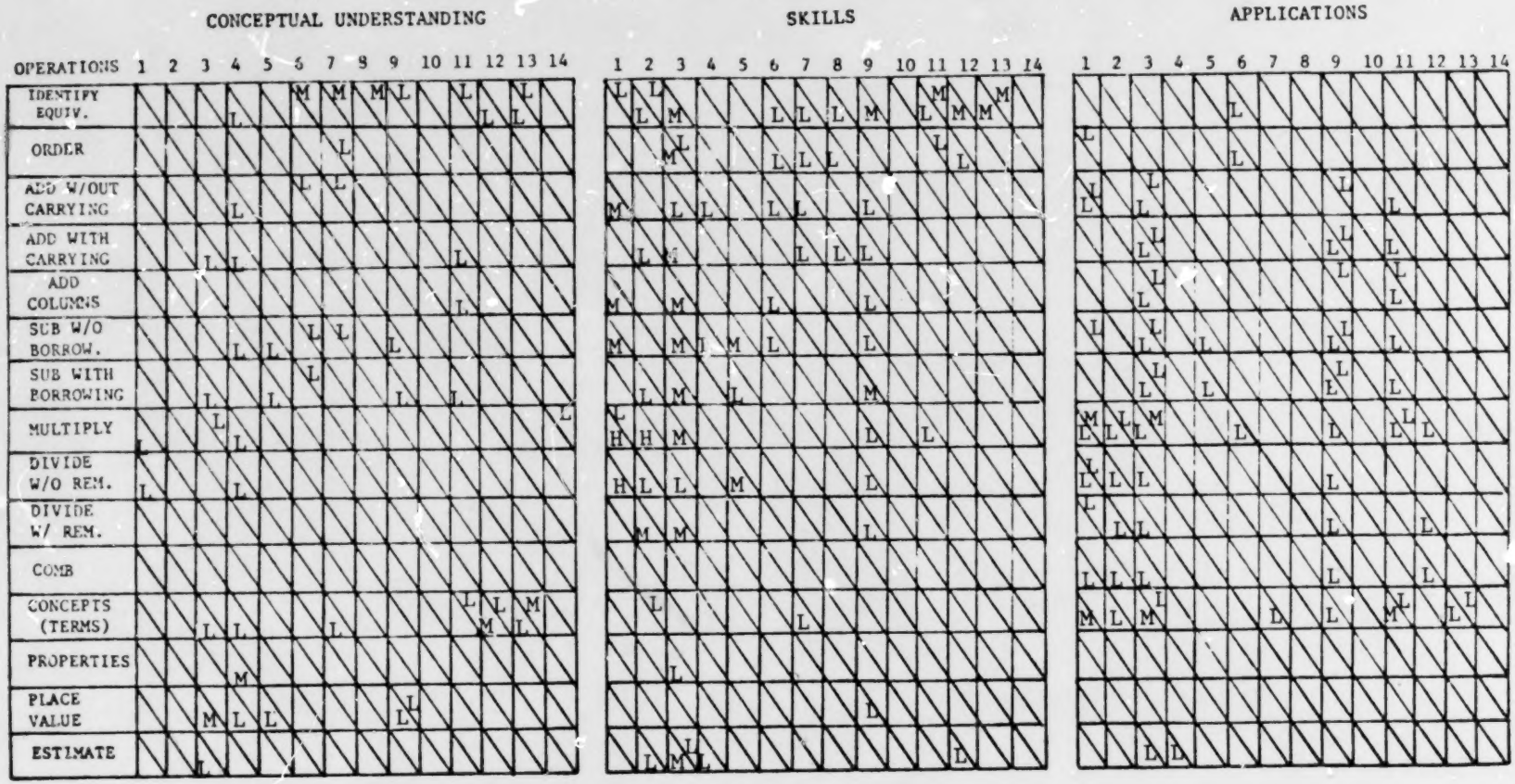
with pictures

NATURE OF MATERIAL

1. sing. dig./basic facts
2. sing. & mult. digit
3. multiple digit
4. no. sen./phrase
5. alg. sen./phrase
6. sing./like frac.
7. unlike frac.
8. mixed no.
9. decimals
10. percents
11. measurement
12. essn. units of measurement
13. geometry
14. other

Figure 5

Distribution of Items in the Scott Foresman Fourth Grade Text



L = less than 0.5% (25 Items)
M = 0.5% to 5.0% (219 Items)
H = 5% to 10% (438 Items)
Ⓗ = more than 10%

w/out pictures

with pictures

NATURE OF MATERIAL

1. sing. dig./basic facts
2. sing. & mult. digit
3. multiple digit
4. no. sen./phrase
5. alg. sen./phrase
6. sing./like frac.
7. unlike frac.
8. mixed no.
9. decimals
10. percents
11. measurement
12. essn. units of measurement
13. geometry
14. other

general categories at Factor I. However, applications of each specific topic are characterized by comparatively low item frequencies. The distribution of items within 52 cells involving specific skills, on the other hand, is characterized by comparatively high item frequencies. Furthermore, as might be expected from the figures in the marginal analysis, this text treats a limited number of specific topics (24 cells) in the area of conceptual understanding. This may be due in part to the format of this textbook. Each unit is typically introduced by a group lesson designed to develop understanding of the concepts to follow. However, these concept-based lessons rarely include independent student exercises and are therefore not fully represented in our analysis.

The overall treatment of specific categories in the Houghton-Mifflin book (Figure 4) is similar to that in the Addison-Wesley book. Again, there is a comparatively large number of low density cells involving applications (76) and a heavy concentration of items within each cell in the skill areas. About the only difference between the two texts is their treatment of the general category of conceptual understanding. The total number of specific topics involving this general category is slightly larger for the Houghton-Mifflin text (31 vs. 24 cells).

The comparatively unique orientation of the Scott-Foresman textbook is reflected in the distribution of items across cells portrayed in Figure 5. The number of specific topics involving conceptual understanding (48 cells) and skills (67 cells) considered in this book is larger than that of the other two texts. Given the marginal level analysis, this more varied treatment of conceptual understanding is not surprising; however, the consideration of a wider range of specific topics involving skills would not be anticipated. The comparatively low frequencies in each cell within the skill area accounts for the apparent discrepancy.

The Optional and Core Curricula

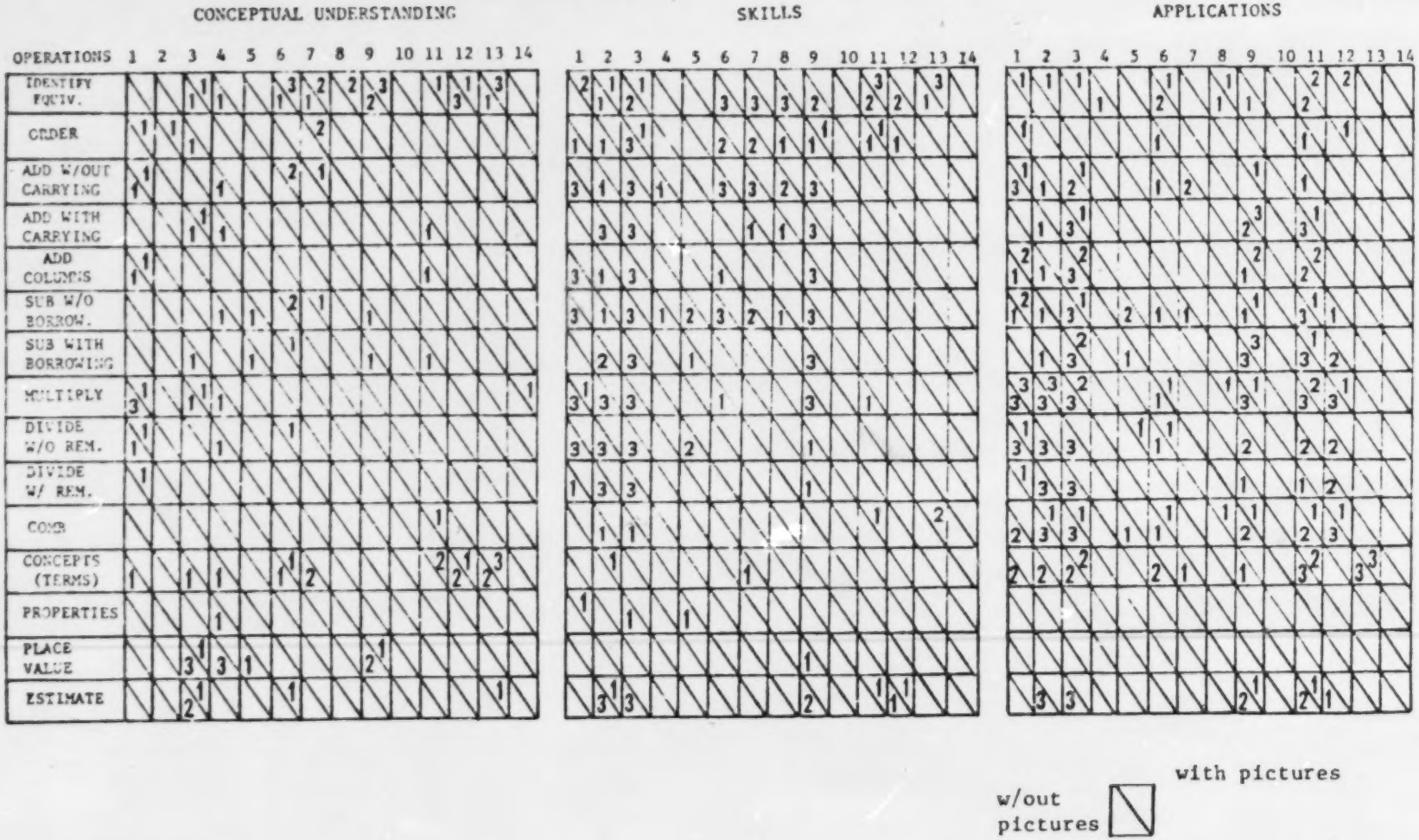
Figure 6 reports the number of textbooks that treat the content described by each cell of the taxonomy. Collectively, the three textbooks cover 293 specific topics. Of these topics, 163 (55.6%) are covered by only one textbook, 60 (20.5%) are covered in two books, and 70 (23.9%) are covered by all three books. Topics considered in only one book or included in all three books are of special interest in our research.

We refer to the set of topics that receive emphasis in one book but not the others as the "optional curriculum." A specific topic is arbitrarily defined as optional if it (a) is covered in only one of the three books and (b) represents at least 0.3% of the item totals for that book (approximately half of one lesson). An optional topic will be included in classroom instruction by a textbook bound teacher if and only if s/he is using the book that covers it. Non-textbook bound teachers, on the other hand, might deliberately decide to cover an optional topic even though it is not included in the book they are using. Thus, optional topics represent those decision points in the curriculum that are most apt to give rise to variation in the content of classroom instruction.

We refer to the set of topics emphasized in all three textbooks as the "core curriculum." A specific topic is arbitrarily included in the core curriculum if it (a) is common to all three books and (b) represents at least 0.5% of the item totals for each book (approximately one lesson). Because these topics are emphasized in all three books, it is likely that both textbook bound and non-textbook bound teachers will cover the core curriculum in classroom instruction. Thus core topics are least apt to represent decision points in the curriculum that give rise to variation in the content of classroom instruction.

Twenty-eight of the 163 topics covered in only one book satisfy

Number of Books Containing Items in Each Cell



w/out pictures

with pictures

NATURE OF MATERIAL

1. sing. dig./basic facts
2. sing. & mult. digit
3. multiple digit
4. no. sen./phrase
5. alg. sen./phrase
6. sing./like frac.
7. unlike frac.
8. mixed no.
9. decimals
10. percents
11. measurement
12. essn. units of measurement
13. geometry
14. other

the definition of optional topics presented earlier. About half of these topics involve conceptual understanding. Examples include understanding both standard and non-standard units of measurement based on pictorial models, estimating fractional parts of pictorial models, and stating the number of sentences needed to solve story problems involving addition, subtraction, or multiplication. Optional topics in the skills area include plotting number pairs on a graph, estimating length of pictured objects, ordering or subtracting mixed numbers, and multiplying a whole number by a fraction. There are only four optional topics involving applications. The uniqueness of three of these topics may be attributed to the fact that they require the student to read numerical values from tables or diagrams before solving the problems.

The results of a "core curriculum" analysis are presented in Table 2. Only 21 of the 70 specific topics common to all three books satisfy the definition of core topics. The data in Table 2 provide solid evidence that the fourth-grade mathematics curriculum may be characterized by its concern with skills. Eighteen of the 21 core topics identified are in the skills area. These 18 topics represent approximately 60% of all items in the Addison-Wesley and Houghton-Mifflin texts and about 40% of the items in the Scott-Foresman book.

Multiplication and division of whole numbers and basic facts receive particular emphasis. Almost one third of the items in all three books represent these skills. Expressed in absolute terms, 1,719 items in the Addison-Wesley, 3,197 items in the Houghton-Mifflin, and 989 items in the Scott-Foresman are computation problems that involve multiplication or division of whole numbers. Items that involve basic number facts constitute approximately 20% of the student exercises. Addition and subtraction facts account for nearly 5% of the total; multiplication facts

Table 2

Analysis of Specific Topics in the Core Curriculum*

	Addison Wesley		Houghton Mifflin		Scott Foresman	
	Items	Lessons	Items	Lessons	Items	Lessons
Conceptual Understanding						
Picture model of fraction	0.8	(3.0)	0.8	(2.4)	1.8	(5.6)
Geometry Terms	1.4	(5.9)	2.3	(7.1)	4.4	(11.7)
Place Value (mult. Digit)	2.1	(2.4)	2.1	(4.8)	3.4	(9.2)
Skills						
Find equiv. fractions	4.2	(4.1)	3.0	(8.9)	1.0	(41.)
Read. Meas. Instruments	0.9	(3.6)	0.6	(4.2)	1.9	(5.6)
Addition w/out carrying						
basic facts	2.1	(2.4)	3.5	(11.3)	2.6	(3.1)
like fractions	1.0	(1.8)	0.8	(3.0)	0.5	(1.5)
mult. digit no.	1.9	(6.5)	2.8	(5.4)	1.9	(3.6)
decimals	1.7	(5.3)	0.7	(6.0)	0.5	(4.1)
Column Addition						
single digit	1.3	(3.0)	1.0	(4.2)	0.9	(2.0)
mult. digit	1.4	(3.6)	0.5	(5.4)	0.8	(3.6)
Subtraction w/out borrowing						
basic facts	2.3	(2.4)	2.3	(5.4)	2.9	(2.6)
like fractions	0.7	(1.8)	0.9	(3.0)	0.6	(1.0)
Subtraction with borrowing						
multiple digit nos.	4.6	(2.0)	2.7	(2.0)	0.7	(0.5)
Multiplication						
basic facts	12.4	(6.5)	11.0	(17.9)	8.2	(8.2)
single & multiple dig.	5.1	(8.9)	8.1	(13.7)	4.9	(8.2)
multiple digits	6.0	(8.3)	4.5	(6.5)	3.5	(7.1)
Division w/out remainder						
single digits	7.9	(4.1)	8.4	(16.7)	5.2	(7.1)
Division with Remainder						
multiple single digit	3.5	(5.3)	5.0	(8.9)	2.2	(8.2)
multiple digits	3.5	(4.7)	2.6	(3.6)	1.8	(6.1)
Estimation	1.8	(2.4)	1.1	(0.5)	1.3	(0.5)
Applications						
Multiplication						
basic facts	0.2	(1.8)	0.5	(6.5)	0.2	(2.6)
single mult. digit	0.2	(2.3)	0.3	(4.2)	0.5	(3.6)
decimals	0.2	(2.4)	0.2	(2.4)	0.6	(3.6)
Division						
basic facts	0.2	(2.4)	0.7	(7.7)	0.2	(2.0)

*entries are percents

represent roughly 10% of the total; and division facts equal about 7% of the items in all three books.

There are only three topics not involving skills that are emphasized in all three books: matching fractions with their pictorial representations, using geometry terms, and performing tasks involving place value. All three of these topics fall in the general area of conceptual understanding. The four topics involving applications included in Table 2 are therefore presented only as a point of reference. None of these topics satisfy the definition of core topics.

As noted earlier, core topics are apt to be covered by all classroom teachers. Differences in the treatment of these topics across textbooks might nevertheless result in variation among teachers in the emphasis they place on these topics. In the Scott-Foresman book, for example, 2.2% of the items involve division of multiple digit numbers with a remainder. The corresponding figure for the Houghton-Mifflin book is 5.0%. Thus a textbook bound teacher who uses the Houghton-Mifflin book may emphasize this topic to a greater extent than a colleague who uses the Scott-Foresman text. Table 2 also suggests that the Addison-Wesley book has the highest percent of items dealing with multiplication facts, but the smallest percent of lessons dealing with this topic. Thus multiplication facts receive extensive treatment in a comparatively small number of lessons in the Addison-Wesley text. In short, there is evidence that at least some variation in classroom emphasis of core topics could occur when teachers use different textbooks.

Summary and Conclusions

The data summarized in this paper provide evidence for each of the following general conclusions:

1. A "core curriculum" in fourth grade mathematics does exist.

   - As reflected in widely used textbooks, this curriculum can best be described as having primary concern for those computational skill areas that are commonly associated with the current "back to basics" and "minimal competency" trends. Multiplication or division of whole numbers and basic number facts are particularly strong components of the core curriculum of fourth-grade mathematics textbooks.

2. Variation in content covered in different textbooks could result in variation in content taught in the classroom.

   - Evidence summarized in Table 1 and Figures 3 through 5 suggests that textbooks vary in their treatment of both general (marginal totals) and specific (cell totals) topics as defined by the taxonomy.
   - Evidence summarized in Figure 6 suggests that more than half of the specific topics identified in the analysis of all three books were covered in only one text. These "optional curriculum" topics are most apt to represent decision points that may result in variation in the content of classroom instruction.
   - Table 2 provides at least some evidence that textbooks even vary in their treatment of "core" topics. Although these differences are not apt to influence teachers' selection of classroom content, they may result in differences in the extent to which core topics are emphasized in the classroom.

3. In general, content decisions that are left to the teacher require a comparatively high level of expertise in mathematics.

- The "core curriculum" described in this study is concentrated almost exclusively in the area of skills. In view of the emphasis placed on skills topics in all three textbooks, teachers may feel compelled to teach them.
- The "optional curriculum" described in this study is focused primarily in the general area of conceptual understanding. Those teachers who are not bound to a single textbook may exercise considerable latitude in deciding whether or not to cover optional topics in the classroom.
- It is generally agreed that understanding the "whys" of mathematics demands a higher level of expertise than a straight-forward performance of skills. Thus, content decisions which are left to the teacher may be those that teachers are least well prepared to make.

4. Differences in classroom content are almost certain to occur among those textbook bound teachers who use different books.
   - Evidence from the literature suggests that over 50% of all elementary school teachers are textbook bound.
   - Evidence provided by this study suggests that over 50% of specific topics treated in three widely used fourth-grade mathematics textbooks are covered in only one of the three books studied.

These findings suggest that variation among textbooks will have a significant influence on the content of mathematics instruction in at least 50% of all elementary school classrooms.

Reference Notes

1. Armbruster, B.B., Stevens, R.J., & Rosenshine, B. Analyzing content coverage and emphasis: A study of three curricula and two tests (Tech. Rep. No. 26). Urbana, Ill.: Center for the Study of Reading, University of Illinois at Urbana-Champaign, 1977.

2. Porter, A.C., Schmidt, W.H., Floden, R.E., & Freeman, D.J. Impact on what? The importance of content covered (Res. Ser. No. 2). East Lansing, Mich.: Institute for Research on Teaching, Michigan State University, 1978.

3. Grosser, L.L. Utilization of instructional evaluation instruments. Unpublished manuscript, Michigan State University, 1978.

4. Perkins, J., & Buchanan, A. Interrelating the content of instruction and the content of standardized test batteries: Method and illustration (Tech. Rep.). Los Alamitos, California: SWRL Educational Research and Development, 1978.

5. Buchanan, A., & Milazzo, P. General patterns in K-6 mathematics instruction and achievement, Report no. 1: Overall trends. Los Alamitos, California: SWRL Educational Research and Development, 1978.

6. McDonald, F.J. Research on teaching and its implications for policy-making: Report on phase II of the beginning teacher evaluation study. Paper presented at the conference on Research on Teacher Effects, School of Education, University of Texas, Austin, November 1975.

7. Wilson, J.W., Cahen, L.S. and Begle, E.G. NLSMA Reports. Vols. 1-25. Stanford University: The Board of Trustees of Leland Stanford Junior University, 1968-72.

8. Floden, R.E., Porter, A.C., Schmidt, W.H., & Freeman, D.J. Don't they all measure the same thing?: Consequences of standardized test selection (Res. Ser. No. 25). East Lansing, Mich.: Institute for Research on Teaching, Michigan State University, 1978. (Paper presented at the Center for the Study of Evaluation Winter Conference on Measurement and Methodology, Los Angeles, January 1978.)

9. National Advisory Committee on Mathematics Education. Overview and analysis of School Mathematics: Grades K-12. Conference Board of the Mathematical Sciences, Washington, D.C., 1975.

10. National Council of Teachers of Mathematics. An in-service handbook for mathematics education. A. Osborne (Ed.) NCTM, Reston, Va. 1977.

11. Avital, S.M., & Shettleworth, S.J. Objectives for mathematics learning: Some ideas for the teacher (Bulletin No. 3). Toronto, Ontario: Ontario Institute for Studies in Education, 1968.

12. Blake, K.A., Ellis, A.A., Findley, W.G., & Westbrook. H.R. Organization of mathematics in grades 4, 5, and 6 (Office of Education, U.S. Department of Health, Education and Welfare Cooperative Research Project No. 2531). University of Georgia, 1966.

13. Buchanan, A. Proficiency verification systems (PVS): Index of mathematical skills (Tech. Note No. 3-76-01). Los Alamitos, California: SWRL Educational Research and Development, February 27, 1976.

14. Freeman, D.J. Conceptual issues in the content/strategy distinction. (Res. Ser. No. 21). East Lansing, Mich.: Institute for Research on Teaching, Michigan State University, 1978. (Paper presented at the annual convention of the American Educational Research Association, Toronto, March 1978.)

15. Schmidt, W.H. Measuring the content of instruction (Res. Ser. No. 35). East Lansing, Mich.: Institute for Research on Teaching, Michigan State University, 1979. (Paper presented at the annual convention of the American Educational Research Association, Toronto, March 1978.)

16. Kuhs, T., Schmidt, W., Porter, A., Floden, R., Freeman, D., & Schwille, J. Taxonomy for the classification of elementary school mathematics content. (Res. Ser. No. 4). East Lansing, Mich.: Institute for Research on Teaching, Michigan State University, 1979.

References

Airasion, P.W., & Madaus, G.F. A study of the sensitivity of school and program effectiveness measures. Boston, Massachusetts: Boston College, 1976.

Anderson, B.L. Differences in teachers' judgment policies for varying numbers of verbal and numerical cues. Organizational Behavior and Human Performance, 1977, 19, 68-88.

Bloom, B.S. Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain. New York: David McKay Company, Inc., 1956.

Comber, L.C., & Keeves, J.P. Science education in nineteen countries. New York: John Wiley and Sons, 1973.

Corwin, R.G. Militant professionalism: A study of organizational conflict in high schools. New York: Meredith Corporation, 1970.

Hungerman, A.D. Achievement and attitude of sixth-grade pupils in conventional and contemporary mathematics programs. The Arithmetic Teacher, 1967, 14, 30-39.

Husen, T. International study of achievement in mathematics: A comparison of twelve countries. Vols. I and II, New York: John Wiley, 1967.

Jenkins, J.R., & Pany, D. Curriculum biases in reading achievement tests (Tech. Rep. No. 16). Urbana, Ill.: Center for the Study of Reading, University of Illinois at Urbana-Champaign, 1976.

Shavelson, R.J. Teachers' decision making. In N.L. Gage (Ed.), The psychology of teaching methods: The seventy-fifth yearbook of the National Society for the Study of Education, Part I. Chicago: University of Chicago Press, 1976.

Shavelson, R.J., Cadwell, J., & Izu, T. Teachers' sensitivity to the reliability of information in making pedagogical decisions. American Educational Research Journal, 1977, 14, 83-97.

Shulman, L.S., & Elstein, A.S. Studies of problem solving, judgment, and decision making: Implications for education research. In F.N. Kerlinger (Ed.), Review of research in education. Itasca, Ill.: F.E. Peacock, 1975.

Walker, D.F., & Schaffarzick, J. Comparing curricula. Review of Educational Research, 1974, 44(1), 83-111.

Wood, R. Objectives in teaching of mathematics. Educational Research, 1968, 10, 83-98.

PUBLICATIONS

of the

Institute for Research on Teaching
Michigan State University

as of

May 1, 1979

To order any of the following publications please send check, money order, or prepaid purchase order -- payable to Michigan State University -- to: IRT Publications, 252 Erickson, MSU, East Lansing, MI 48824. Publication prices include only the cost of production and mailing. Michigan residents should add a 4% state sales tax to all orders. The Institute for Research on Teaching is funded primarily by the National Institute of Education, United States Department of Health, Education, and Welfare.

Research Series

No. 1 The Inquiry Theory: An information-processing approach to clinical problem-solving research and application. J.F. Vinsonhaler, C.C. Wagner, & A.S. Elstein. 1978. $2.00

No. 2 Impact on what? The importance of content covered. A.C. Porter, W.H. Schmidt, R.E. Floden, & D.J. Freeman. 1978. $1.75

No. 3 Instructions for using the AJ 832 plotting software package as modified for the CDC 6500 computer. M. Carlyn. 1977. $1.75

No. 4 A taxonomy for classifying elementary school mathematics content. T. Kuhs, W. Schmidt, A. Porter, R. Floden, D. Freeman, & J. Schwille. 1979. $2.25 (This is a revision of an earlier publication, Training manual for the classification of the content of fourth-grade mathematics.)

No. 5 Flexner, accreditation, and evaluation. R.E. Floden. 1978. $1.75

No. 6 Analogy and credentialling. R.E. Floden. 1978. $1.25

No. 7 Conceptions of reading: The Rep Test. M. Johnston. 1978. $1.00

No. 8 Research and development needs for the advancement of teacher education. J.E. Lanier & R.E. Floden. 1978. $3.00

No. 9 On the conceptualization of clinical problem solving. C.C. Wagner & J.F. Vinsonhaler. 1978. $1.50

*No. 10 Applications of the Inquiry Theory to reading and learning disabilities. L. Patriarca, J. VanRoekel, & J.F. Vinsonhaler. 1979.

No. 11 Methods for discovering cues used by judges: Two working papers. C.M. Clark & R.J. Yinger. 1978. $1.00

No. 12 Research on teacher thinking. C.M. Clark & R.J. Yinger. 1978. $2.25

No. 13 Data analysis strategies for quasi-experimental studies where differential group and individual growth rates are assumed. S. Olejnik. 1978. $2.75

No. 14 CLIPIR Pilot Observational Study of Reading Diagnosticians, 1976. A. Lee & A. Weinshank. 1978. $2.00 (with complete data, $5.75)

No. 15 The Inquiry Theoretic approach to clinical problem-solving research and application: Basic Management Information System (BMIS) technical manual Vol. 1. J.F. Vinsonhaler, C.C. Wagner, A.S. Elstein, & L.S. Shulman. 1978. $4.50

No. 16 The user's manual for the Basic Management Information System: BMIS technical manual Vol. 2. C.C. Wagner, J.F. Vinsonhaler, A.S. Elstein, & L.S. Shulman. 1978. $17.00

No. 17 Teachers' conceptions of reading: The evolution of a research study. R. Barr & G.G. Duffy. 1978. $1.25

No. 18 A study of teacher planning: Description and model of preactive decision making. R.J. Yinger. 1978. $4.25

No. 19 Fieldwork as basis for theory building in research on teaching. R.J. Yinger. 1978. $2.25

No. 20 Choice of a model for research on teacher thinking. C.M. Clark. 1978. $1.50

No. 21 Conceptual issues in the content/strategy distinction. D.J. Freeman. 1978. $2.25

No. 22 An econometric perspective on classroom reading instruction. B.W. Brown & D.H. Saks. 1978. $1.75

No. 23 Identifying cues for use in studies of teacher judgment. C.M. Clark, R.J. Yinger, & S.C. Wildfong. 1978. $1.75

No. 24 Teacher autonomy and the control of content taught. A.C. Porter. 1978. $3.75

No. 25 Don't they all measure the same thing? Consequences of standardized test selection. R.E. Floden, A.C. Porter, W.H. Schmidt, & D.J. Freeman. 1978. $1.50

*No. 26 Critical moments in the teaching of mathematics. J.C. Shroyer. 1978.

No. 27 Characteristics of the clinical problem-solving model and its relevance to educational research. (Formerly available as an IRT collateral paper.) A.S. Elstein, L.S. Shulman, J.F. Vinsonhaler, C.C. Wagner, & L. Bader. 1978. $1.25

*No. 28 The consistency of reading diagnosis. J.F. Vinsonhaler. 1978.

*No. 29 Developing simulated cases of reading and learning disabilities. L. Patriarca, J. VanRoekel, & L. Lezotte. 1978.

*No. 30 Simulating the problem solving of reading clinicians. D. Gil, C.C. Wagner, & J.F. Vinsonhaler. 1978.

*No. 31 Training reading specialists in diagnosis. G. Sherman. 1978.

No. 32 Classroom management in the elementary grades. J.E. Brophy & J.C. Putnam. 1978. $3.25

No. 33 An ethnographic study of a teacher's classroom perspective: Implications for curriculum. V.J. Janesick. 1978. $2.25

No. 34 The problem of dead letters: Social perspectives on the teaching of writing. S. Florio. 1978. $1.50

No. 35 Measuring the content of instruction. W.H. Schmidt. 1978. $1.50

*No. 36 The relationship of teacher alienation to school workplace characteristics and career stages of teachers. M.J. Vavrus. 1978. $2.50

No. 37 The relationship between diagnosis and remediation in reading: A pilot study. A. Weinshank. 1978. $1.75

No. 38 Teacher judgment of children's reading preferences. T.E. Evans & J.L. Byers. 1979. $2.00

*No. 39 The teaching styles at South Bay School. B. Joyce. 1979. $2.25

*No. 40 Teachers' thoughts while teaching. B. Joyce. 1979. $2.25

*No. 41 Measuring teachers' beliefs about reading. G.G. Duffy & W. Metheny. 1979. $1.75

No. 42 Studies of clinical problem-solving behavior in reading diagnosis. D. Gil, J.F. Vinsonhaler, & C.C. Wagner. 1979. $2.00

*No. 43 Study of the value/belief patterns of teachers and administrators. P. Cusick. 1979.

No. 44 Teacher perceptions of student affect. R.S. Prawat. 1979. $2.50

*No. 45 Clinical problem solving in reading: Theory and research. D. Gil, L. Hoffmeyer, J. VanRoekel, J. Vinsonhaler, & A. Weinshank. 1979.

No. 46 Defining reading diagnosis: Why, what, and how? D. Gil, J.F. Vinsonhaler, & G. Sherman. 1979. $2.00

Occasional Papers

No. 1 Teachers' concerns and conceptions of reading and the teaching of reading: A literature review. G. Belli, G. Blom, & A. Reiser. 1977. $2.25

No. 2 Teachers and researchers: Toward a proper division of labor. C. Kennedy. 1977. Limited number of free copies.

No. 3 A causal analysis of attitudes toward leadership training in a classroom setting. J.E. Hunter, R.F. Hunter, & J.E. Lopis. 1978. $2.00

*No. 4 The teacher as colleague in classroom research. S. Florio & M. Walsh. 1978.

No. 5 Form and function in mother-toddler conversational turn-taking. M.L. Donahue. 1978. $1.75

No. 6 Individual school buildings do account for differences in measured pupil performance. L.W. Lezotte & J. Passalacqua. 1978. $1.25

No. 7 Research on teaching: A dynamic area of inquiry. J.E. Lanier. 1978. $1.25

No. 8 Test design: A view from practice. L.S. Shulman. 1978. $1.75

No. 9 Relationships between testing and curriculum. A.C. Porter. 1978. $1.00

No. 10 Psychology and mathematics education revisited: 1976. L.S. Shulman. 1978. $1.75

No. 11 Science and mathematics education: Retrospect and prospect. L.S. Shulman & P. Tamir. 1978. $2.00

No. 12 Relating theory to practice in educational research: A working paper. L.S. Shulman. 1978. $1.75

No. 13 Classroom discipline: Toward a diagnostic model integrating teachers' thoughts and actions. D. Gil & P.S. Heller. 1978. $1.00

No. 14 Attention and modality effects in STM: A second look. T. Evans & J. Byers. 1978. $1.75

No. 15 Mere ethnography: Some problems in its use in educational practice. F. Erickson. 1979. $2.00

No. 16 On standards of descriptive validity in studies of classroom activity. F. Erickson. $2.00

*No. 17 Changes in school characteristics coincident with changes in student achievement. W.B. Brookover & L.W. Lezotte. 1979. $5.00 (Executive Summary $1.00)

No. 18 Advances in teacher effectiveness research. J.E. Brophy. 1979. $2.00

No. 19 Research on teaching in the arts: Review, analysis, critique. L.S. Shulman. 1979.

*No. 20 Unidimensional measurement and confirmatory factor analysis. J.E. Hunter & D.W. Gerbing. 1979.

No. 21 Using observation to improve your teaching. J.E. Brophy. 1979. $1.50.

Conference Series

No. 1 Current directions in research on teaching: A meeting of the Invisible College of Researchers on Teaching, November 17-19, 1976. 1977. $4.25

No. 2 Report of a seminar on field research methods in education. P.A. Cusick. 1978. $1.50

No. 3 Proceedings of the Research-on-Teaching Mathematics Conference, May 1-4, 1977. 1978. $8.25

No. 4 Teachers attaining new roles in research: A challenge for the education community. L.D. Shalaway, J.E. Lanier et al. 1978. $3.50

---

*In production and will be available by July 1979. Please write for exact price and publication date. Advance orders can be taken and held until publications are available.